

Applicant : Randy Dean May
Serial No. : 10/688,723
Filed : October 16, 2003
Page : 8 of 13

Attorney's Docket No.: 18327-013001

Amendments to the Drawings:

The attached replacement sheets of drawings includes changes to Fig.1 and Fig. 6 and replace the original sheet including Figs. 1, 2, and 6.

In Figure 1, previous reference numeral 1, 2, 3 within the boxes designated as 19 have been deleted.

In Figure 6, reference numerals 625 and 650 have been added as described in the specification on page 6, lines 4 and 7.

Attachments following last page of this Amendment:

Replacement Sheet (2 page)

REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested.

New claims and claim amendments are presented herein to obviate the current rejection. No new matter has been added.

Drawings

Fig. 1 has been amended to remove the designations 1, 2, 3 in the boxes designated as 19. The specification has been amended to swap reference numerals 27 and 31 so no changes have been made to Fig. 1 in this regard. With regard to Fig. 5, the specification has been amended to delete reference 515 and to clarify that the reference numeral for the InGaAs detector is 523, the light source is 519, and the mirror is 527 and, therefore, no changes have been made to this figure. Fig. 6 has been amended to add reference numerals 625 and 650. Therefore, it is respectfully requested that the objections to the drawings be withdrawn.

Claim Objections

The claims have been amended as suggested to obviate the objections to claims 1 and 6-9. Accordingly, it is respectfully requested that these bases for objection be withdrawn.

Information Disclosure Statement

Enclosed herewith is a copy of an information disclosure statement filed in connection with this matter on July 7, 2004. However, it is noted that it appears that this filing was associated with another application due to an inadvertent typographical error in the serial number on the cover page (the information disclosure statement includes the correct serial number). Consideration of this reference as well as the translation of the German patent received on August 5, 2004 are respectfully requested as the undersigned made a bona fide attempt to comply with 37 CFR §1.98.

35 USC § 102 / § 103

Claims 1, 5, 10, and 13 were rejected under 35 USC §102(e) as allegedly being anticipated by Lievois. Claims 2-4 stand rejected under 35 USC §103(a) as being unpatentable over Lievois in view of Inman. Claims 6-9 and 11 stand rejected under 35 USC §103(a) as being unpatentable over Lievois in view of Murray. Claim 12 stands rejected under 35 USC §103(a) as being unpatentable over Lievois in view of Brand. These rejections are respectfully traversed.

Claim 1 recites a light source emitting light at substantially a single wavelength corresponding to a single absorption line at which water molecules absorb light at a substantially greater level than natural gas molecules. Claims 5, 10, and 13 recite similar limitations.

Lievois describes an arrangement with a light source operates such that infrared light is substantially transmitted through a liquid hydrocarbon phase and substantially absorbed by a

water phase (see, inter alia, Lievois col. 2, lines 50-53). The light source probe used to transmit such light is a light emitting diode.

With the claimed subject matter, a single H₂O spectral line is selected at which one of thousands of nearby absorption lines of CH₄ are not present. Such an arrangement can only occur in the gas phase with a high resolution light source. In the liquid phase (which is the phase in which the arrangement of Lievois operates), all the rotational structure is obliterated and one can only see a very wide "blob" representing the entire absorption band. Lievois describes using a LED as a light source. With such LEDs, the spectral linewidth is quite large (e.g., many tens, or hundreds, of nanometers) and such LEDs typically have a full-width at half-max (FWHM) emission profile of more than 400 nm. In contrast, a light source emitting light at substantially a single wavelength corresponding to a single absorption line, such as 2735 nm, might have a FWHM of typically 0.2 cm⁻¹/atmosphere, so at 1 atm pressure the FWHM is 0.2 cm⁻¹ = 6 GHz = 0.15 nm (at 2735 nm 1 GHz is 0.025 nm).

The LED linewidth is therefore nearly 3000 times wider than the H₂O linewidth, while a TDL linewidth is 1/75th of the H₂O linewidth. To do "single line spectroscopy" the linewidth of the light source must be narrower than the molecular spectral linewidth, or at the worst similar in width. One cannot accomplish single line spectroscopy on a gas phase molecule using an LED as described by Lievois. Furthermore, a skilled artisan have not been motivated to adapt Lievois which relates to a wide width light source making liquid phase measurements and any of the cited art to provide the claimed subject matter.

Accordingly, the claims 1, 5, 10, and 13 and their respective dependent claims should be allowable.

Double Patenting

Enclosed herewith is a terminal disclaimer with regard to U.S. Pat. No. 6,657,198. Accordingly, it is respectfully requested that the double patenting rejections be withdrawn.

Concluding Comments

It is believed that all of the pending claims have been addressed in this paper. However, failure to address a specific rejection, issue or comment, does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above are not intended to be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Kindly change the Attorney Docket Number for this matter to: 18327-013001.

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Serial No. : 10/688,723
Filed : October 16, 2003
Page : 13 of 13

Attorney's Docket No.: 18327-013001

A \$65.00 check is enclosed for the fees associated with the Terminal Disclaimer. Please apply any additional charges or credits to deposit account 06-1050.

Respectfully submitted,



Date: 10/11/05

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